



**Ministry of Agriculture**  
**Sustainable Land Management Program (SLMP)**

**KfW SLM-III Project**

**Mobile Based Geopoint, Geotrace and Geoshape  
Activity Spatial Data Collection and Reporting**

**Training and Demonstrations**

**By: Yoseph Zeleke:  
SLMP/RLLP-Database Manager (MSc IT/IS)**

**February, 2024**

# Geo-enabling (GEMS) Smartphones / Tablets Based Project Data Collection and Summary Report



Mobile Data Collection  
using



ODK Collect  
Open Data Kit  
PEGI 3

# Kobo Toolbox Mobile Based Data Collection



Introduction to Geo-enabling Mobile  
Baseline Data Collection and M&E



Project DB Account Create



Using the App 'ODK Collect' on  
your Android Device



Data collection and analysis steps



Collection "Point", "Line" and "Area" Types Data



ODK Collect  
Open Data Kit  
PEGI 3

Mobile Data Collection  
using  
**KoBoToolbox**

## **Purpose: Geo-enabling for Project Data Collection**

- Platform for effective project planning, prioritization, implementation and M&E in close coordination with partners and stakeholders
- Verification of physical sites & implementation works and project progress in remote areas
- Third Party Monitoring- Remote supervision of date, time & locations
- Verification of interview and survey activities and automated recording of meta data
- Recording detailed beneficiary data and interactions with beneficiaries systematic methods for tracking community engagement
- Activities structured analysis, monitoring, and geo-tagging of points

# What is Kobo Toolbox?

- **Kobo Toolbox** is a platform for field data collection and reporting. It's used to collect and report data with better quality data, combines process of collecting and recording, faster than pen and paper, reduces errors, even in the challenging environments.
- **Kobo Toolbox** allows you to easily develop digital data collection forms that work on both mobile devices and web browsers.
- The software is works both **online and offline**.

- **Kobo Toolbox ... cont.**

- **Kobo Toolbox** allows you to manage your data by aggregating the data collected from different devices, accessible through the Kobo Toolbox interface. This data can then be downloaded into multiple formats for use in applications such as Excel, SPSS or GIS software.

# The geo-enabling method is cheap, easy to implement, scalable & sustainable

- Simple and free technology (ODK)
  - Customized data forms
  - No internet/network connection needed
  - Automatic data integration in centralized MIS or M&E system
  - Automatic mapping of interventions
  - Easy to scale across portfolio/partners
  - No ICT experts needed
- **Building Capacity with clients for systematic and sustainable use**

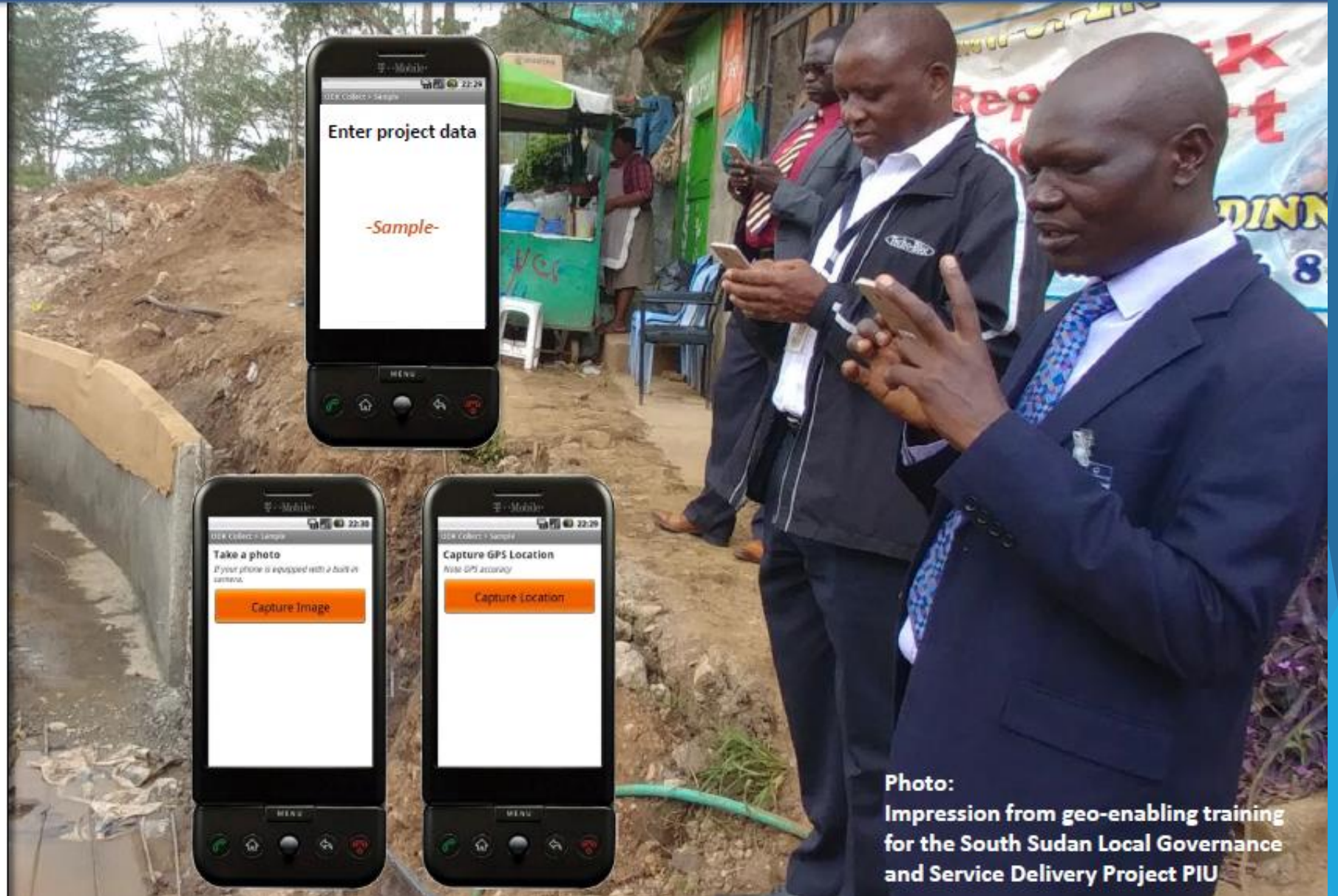














Photo: Impression from geo-enabling training for the South Sudan Local Governance and Service Delivery Project PIU





# Question Types

---








	Select One	Multiple choice question; only one answer can be selected.		Date	Date input.
	Select Many	Multiple choice question; multiple answers can be selected.		Time	Time input.
	Text	Free text response.		Date & time	Accepts a date and a time input.
	Number	Whole number input.		Photo	Take a picture or upload an image file.
	Decimal	Decimal input.		Audio	Take an audio recording or upload an audio file.
	Note	Display a note on the screen, takes no input.		Video	Take a video recording or upload a video file.












# Question Types

Question type	Icon	Answer input
integer	123	Integer (i.e., whole number) input.
decimal	1.0	Decimal input.
range	1..1	Range input (including rating).
text	abc	Free text response.
select_one [options]		Multiple choice question; only one answer can be selected.
select_multiple [options]		Multiple choice question; multiple answers can be selected.
select_one_from_file [file]		Multiple choice from file; only one answer can be selected.
select_multiple_from_file [file]		Multiple choice from file; multiple answers can be selected.

# Question Types




rank [options]	n/a	Rank question; order a list.
note		Display a note on the screen, takes no input. Shorthand for type=text with readonly=true.
geopoint		Collect a single GPS coordinate.
geotrace		Record a line of two or more GPS coordinates.
geoshape		Record a polygon of multiple GPS coordinates; the last point is the same as the first point.
date		Date input.
time		Time input.
dateTime		Accepts a date and a time input.

# Question Types

image		Take a picture or upload an image file.
audio		Take an audio recording or upload an audio file.
background-audio		Audio is recorded in the background while filling the form.
video		Take a video recording or upload a video file.
file		Generic file input (txt, pdf, xls, xlsx, doc, docx, rtf, zip)
barcode		Scan a barcode or QR Code
calculate	$1+1$	Perform a calculation; see the Calculation section below.
acknowledge		Acknowledge prompt that sets value to "OK" if selected.
hidden		A field with no associated UI element which can be used to store a constant.
xml-external		Adds a reference to an external XML data file.

# Question Types

---

Formbuilder Question type	Icon	Answer input
Rating		Compare different items using a common scale.
Ranking		Compare a list of different objects to one another.
Question Matrix		Create a group of questions that display in a matrix format.

# All-in-one tool for M&E: KoBoToolbox – what it does



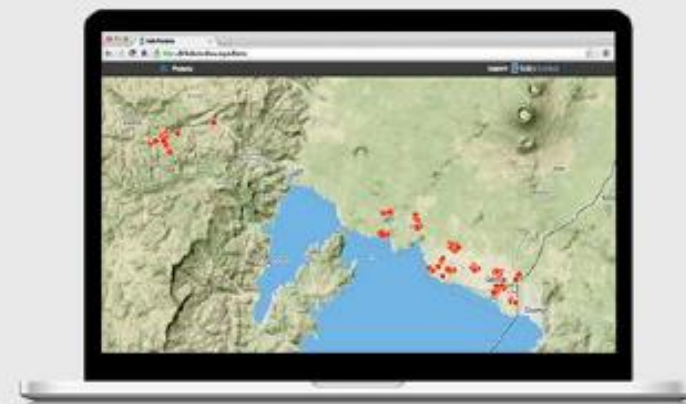
## BUILD FORMS AND REUSE EXISTING QUESTIONS

Easily create survey forms through our intuitive and powerful tool. Store recurring questions in your library or share them with colleagues.



## COLLECT DATA

Quickly and reliably collect your survey data on Android, iOS, and many other devices, online or offline, in any language and with complex skip logic.



## ANALYZE AND MANAGE DATA

Inspect your data moments after it was collected - or download it for advanced analysis in other software in Excel, CSV, KML, and other formats.

# • **Data Collection Strategy**

## ▶ **WHY:**

- ▶ To collect and report **Geopoint, Geotrace and Geoshape** data on NRM/SWC implementation status of the watersheds

## ▶ **WHAT:**

- ▶ Physical SWC measures, Area closure, Physical treatment of gully, Afforestation /Reforestation of degraded-land, ... etc

## ▶ **HOW:**

- ▶ Data collection at Location Specific Activity (LSA) level using Mobile based Kobo Toolbox / ODK Android device.

## ▶ **WHO:**


- ▶ WFP/WSC/WTC/ZFP/Enumerators ... etc


## ▶ **WHEN:**


- ▶ Data collection at micro-watershed level as of next agreed action plan during the workshop

+ Start new form

 Drafts

 Ready to send

 Sent 1

 Download form

 Delete form

ODK Collect v2023.2.4

odk.ona.io

+ Start new form

 Drafts

× Projects

 odk.ona.io  
jennyk / odk.ona.io

Settings

 stage-odk.ona.io  
onasupport / odk.ona.io

 Add project

 About

### Server Settings

Type  
ODK

URL  
Https://odk.ona.io

Username

Password

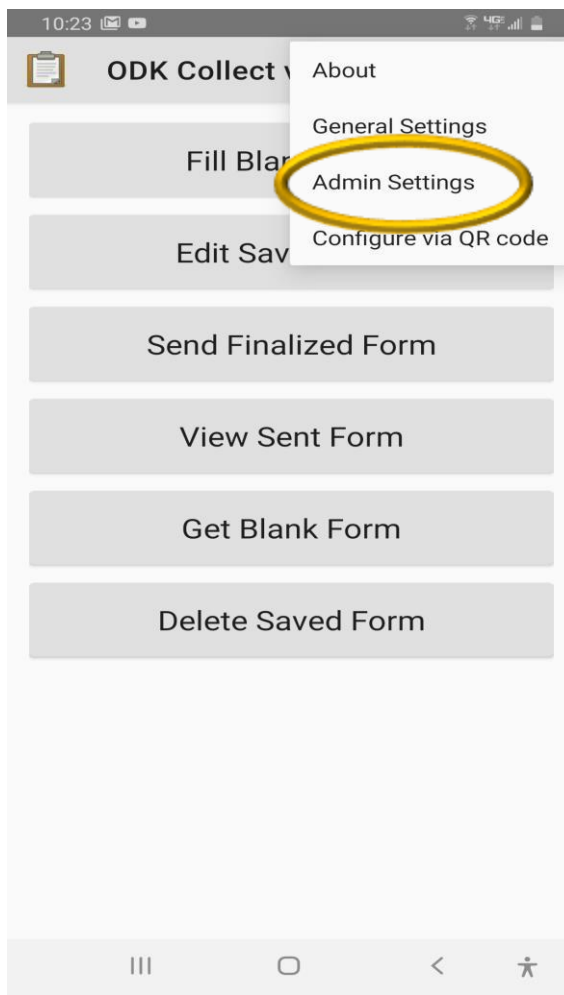
# App Configuration Using QR Code: Setup Your "Template" Device

## Template Device

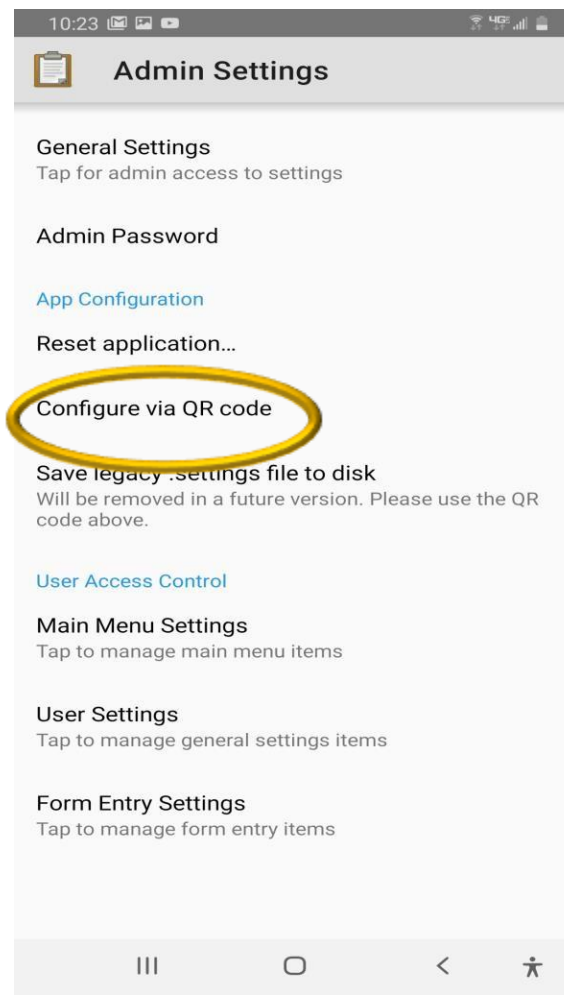
Ensure that you have accurately configured your first "template" device. It is crucial that this is appropriately setup, as all of its settings will be transferred to the next devices via the QR code.

Once your template device is properly setup, open ODK Collect and follow these steps.

**Step 1**  
Navigate to  
"Admin Settings"



**Step 2**  
Select  
"Configure via QR code"



**Step 3**  
Ensure that your  
template device displays  
a QR code similar to this

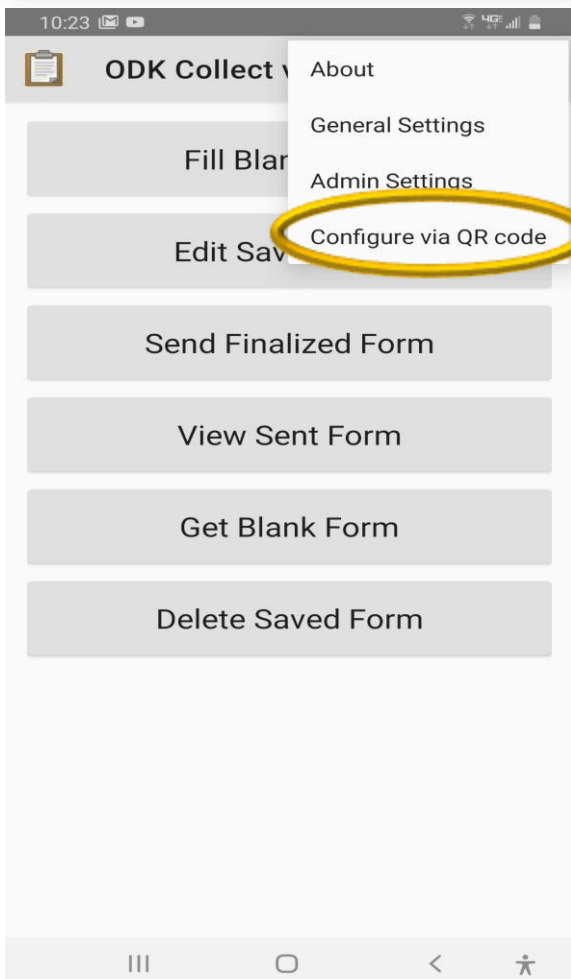




# App Configuration Using QR Code: Transfer Settings to New Device by Scanning

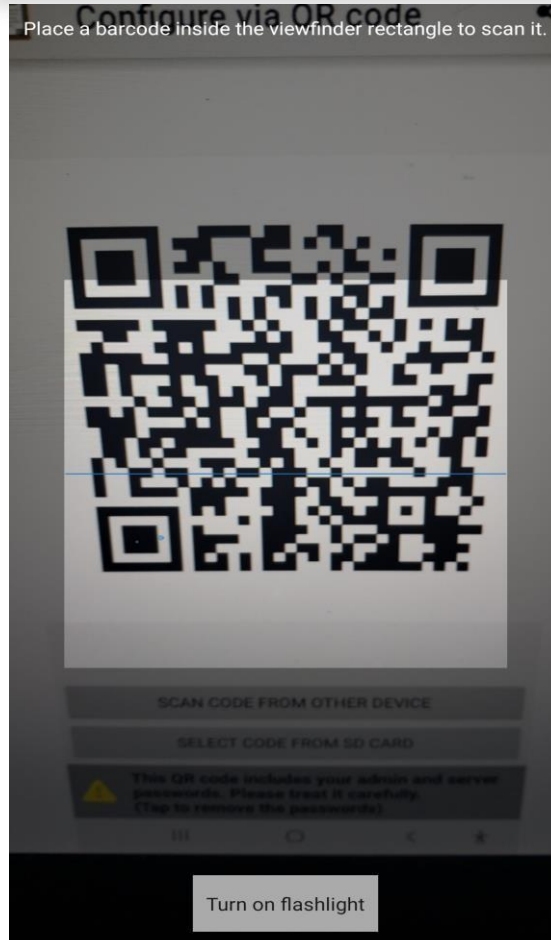
## Step 1

Navigate from Main Menu  
“...” to “Configure via  
QR Code”



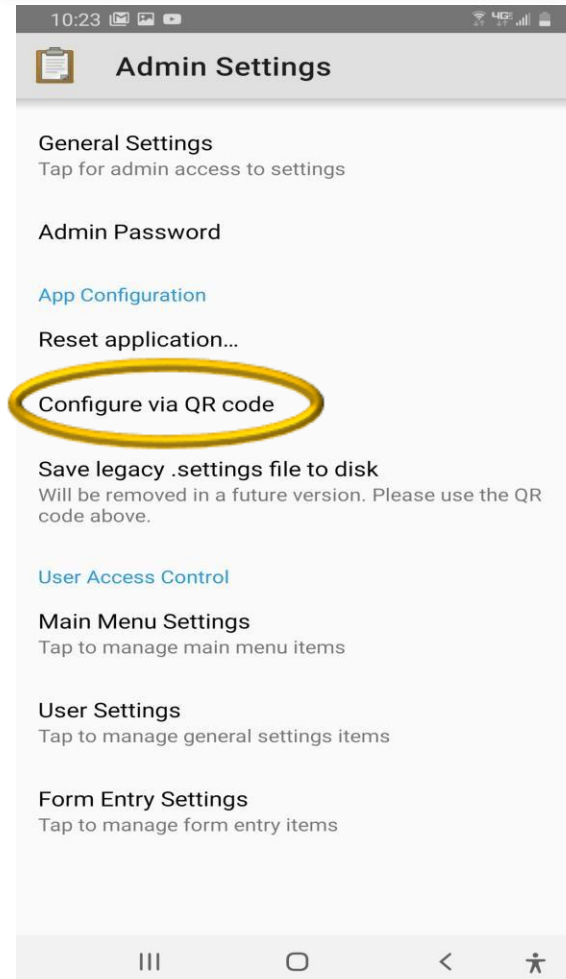
## Step 2

With the new device, scan  
the QR code showing on  
the template device



## ALTERNATE Step 1

You can open the QR code  
scanner in the  
“Admin Settings”



## ALTERNATE Step 2

On the new device,  
select “SCAN CODE  
FROM OTHER DEVICE”



# Appearance of “Area” type data with Kobo Collect

- Geoshape: to trace the boundaries of watershed activities plots in a survey



latitude (x.y °)

6.9869608

longitude (x.y °)

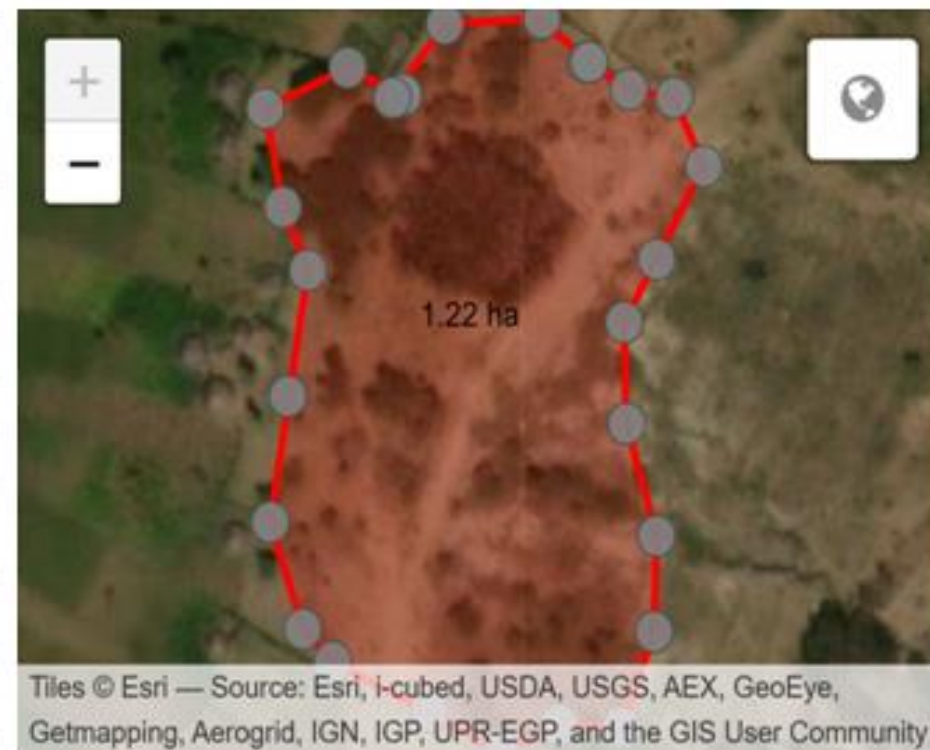
38.3214266

altitude (m)

191

accuracy (m)

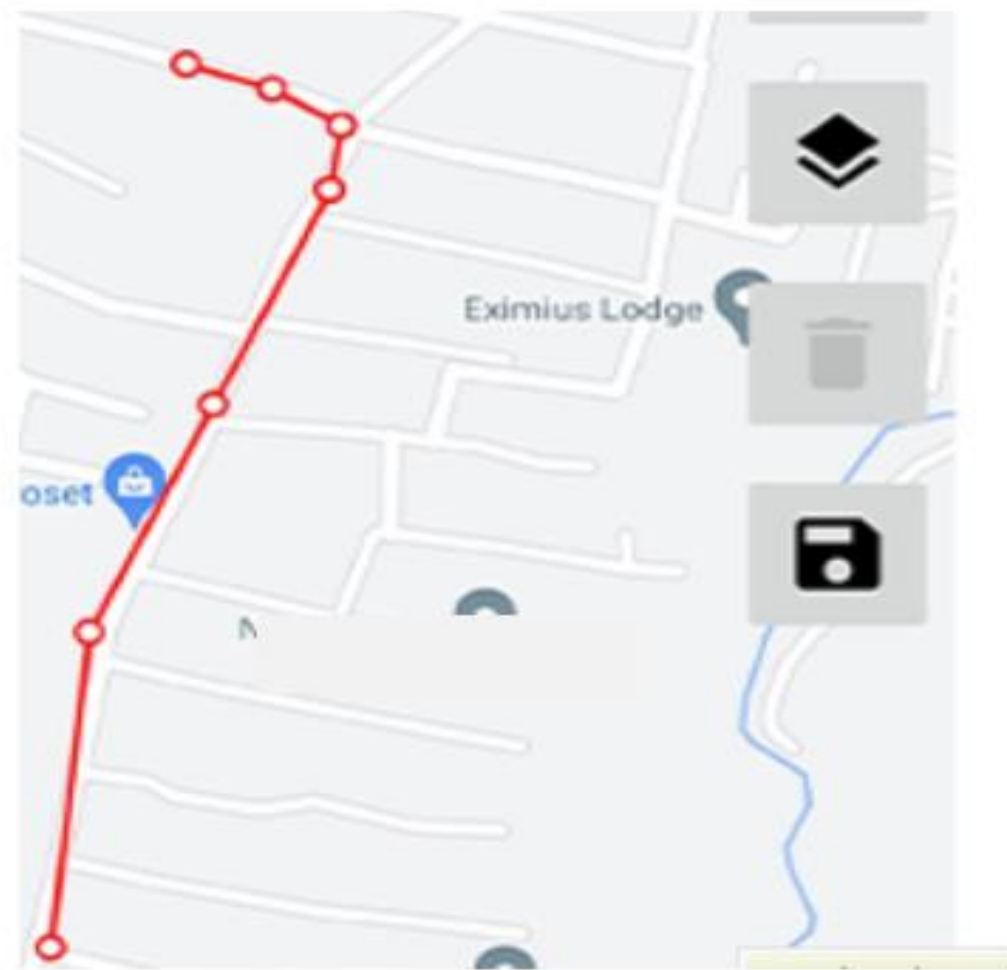
1.7€



- Region: Sidama
- Woreda: Hawasa Zuria
- Major Ws: Iara
- Micro Watershed: Fachacha

# Appearance of “Line” data types Kobo Collect

- Geotrace: use a “Line” type data to to trace a path for collecting location data on features such as roads, tracks and rivers.



# Appearance of “Point and Area” type data with KoboCollect

## Geopoint, Geoshape, Photo and Video Capture Data



Tiles © Esri — Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, UPR-EGP, and the GIS User Community

### Area Boundary plot

### GPS points data

latitude (x.y °)

6.7506421

longitude (x.y °)

38.4630222

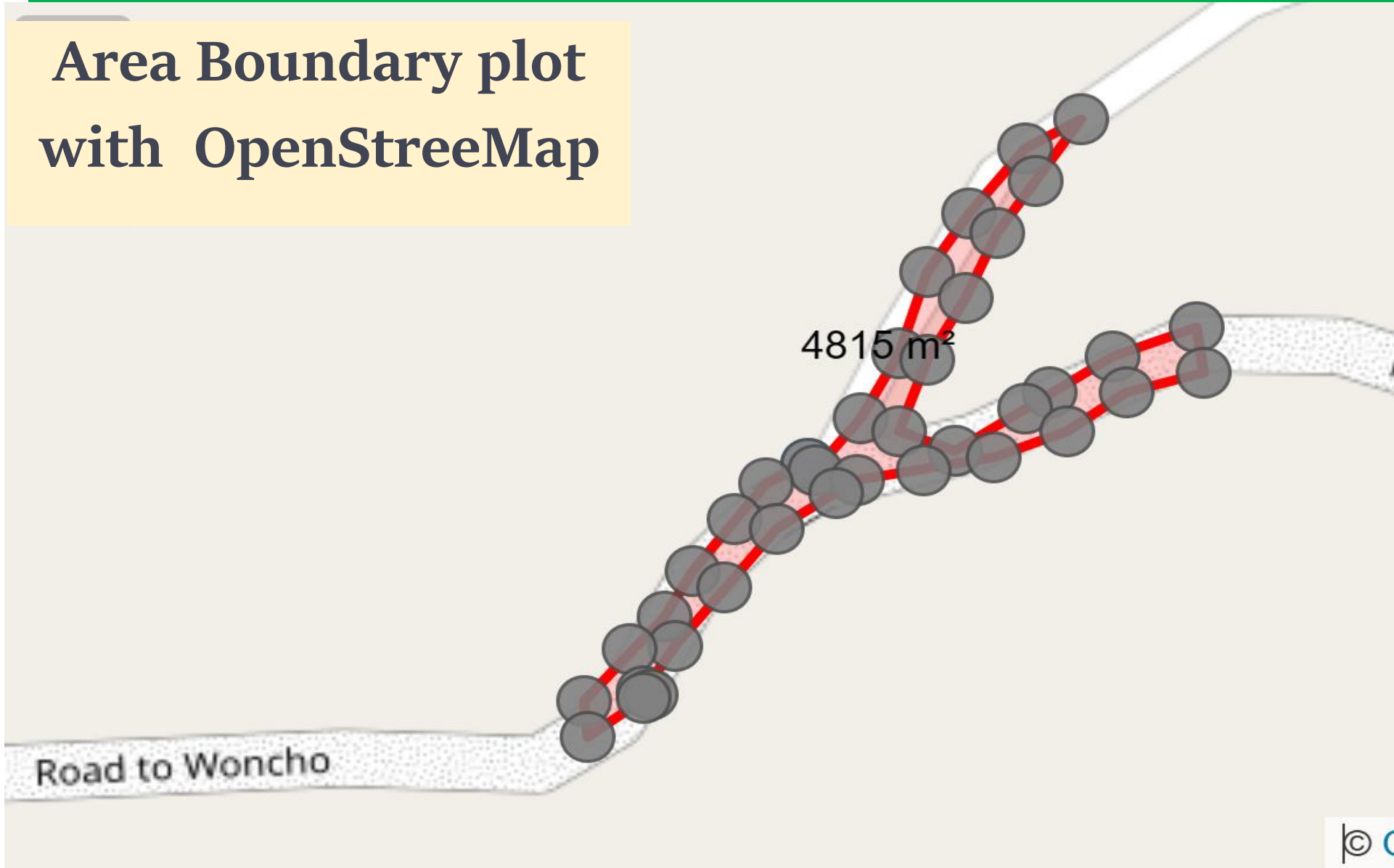
- **Region:** Sidama
- **Woreda:** Wonsho
- **Major Ws:** Oricha G-ee
- **Micro Watershed:** Geo 1

# Appearance of “Point and Area” type data with KoboCollect

Geopoint, Geoshape, Photo and Video Capture Data

Area Boundary plot  
with OpenStreetMap

Capture  
Photo data



latitude (x.y °)

6.7506421

longitude (x.y °)

38.4630222

- Region: Sidama
- Woreda: Wonsho
- Major Ws: Oricha G-eo
- Micro Watershed: Geo 1

## Smartphone/tablets specifications

Feature	Specification	Comments
Battery	≥ 3000 mAh	Longer battery life
Sensor	Compass, accelerometer, gyro	
WiFi	Hotspot, WiFi,	Data transfer to the server and downloading of forms
GPS	GPS, A-GPS, GLONASS, etc.	Capturing location with shorter time to first-fix. Capturing location based on satellite only (not just with cellular/wifi network)
USB	Port 3.0 or Type-C	For transferring data and or charging the phone
Camera	Yes	Taking photos or videos of investments
Memory card slot	Yes	Sometimes useful for transferring forms or data
Screen size	≥ 5.8 inches	Large screen size for questions whose drop-down are longer
Network	3G/4G	Cellular network for communicating or hot spot using network provider

## ➤ **Inaccurate Data Problems**

- **Inaccurate data** is data that contains errors that affect its quality and reliability.
- **Incomplete data:** refers to data sets that lack specific attributes, details, or records, creating an incomplete picture of the subject ... etc
- **Inconsistent Data:** Inconsistency in data quality reasons include missing data, inefficient data management, and standards.
- **Unstructured data:** can be considered a data quality issue due to many factors. As unstructured data refers to any type that does not organize
- **Outdated Data:** Data can become obsolete very fast and inevitably leads to data decay.
- **Missing data:** missing values, occur when no data value is stored for the variable in an observation.

## ➤ **The Seven C's of Data Curation**

The data curation process is a sequence of steps that improves data quality and facilitates further data sharing, processing, and use.

- 1. Collect** – Interface to the data sources and accept the inputs
- 2. Characterize** – Capture available metadata
- 3. Clean** – Identify and correct data quality issues
- 4. Contextualize** – Provide context and provenance
- 5. Categorize** – Fit within a framework that defines the problem domain
- 6. Correlate** – Find relationships among the various data
- 7. Catalog** – Store and make data and metadata accessible with application program interfaces (APIs) for search and analysis



An aerial photograph showing a vast landscape of terraced agricultural fields. The fields are arranged in a complex, winding pattern across rolling hills, with colors ranging from golden yellow to brown, indicating different stages of crop growth or soil types. A dirt road winds through the center of the fields. Scattered trees and small buildings are visible throughout the landscape.

# Documentations Knowledge and Innovations

Ejere Woreda, Berga Watershed,  
Oromia Region

# SLMP/RLLP M&E, Data Management, Communication and Knowledge Sharing Platform



**SLMP Worda Information Center**  
Mini-Digital Library & Knowledge and Innovations



**SLMP-KMIS System** [www.slmkmis.gov.et](http://www.slmkmis.gov.et)  
Planning, Report, Data Management



**SLMP Digital Repository**  
<http://slmkmis.gov.et:8080/jspui/> [www.slm.gov.et](http://www.slm.gov.et)



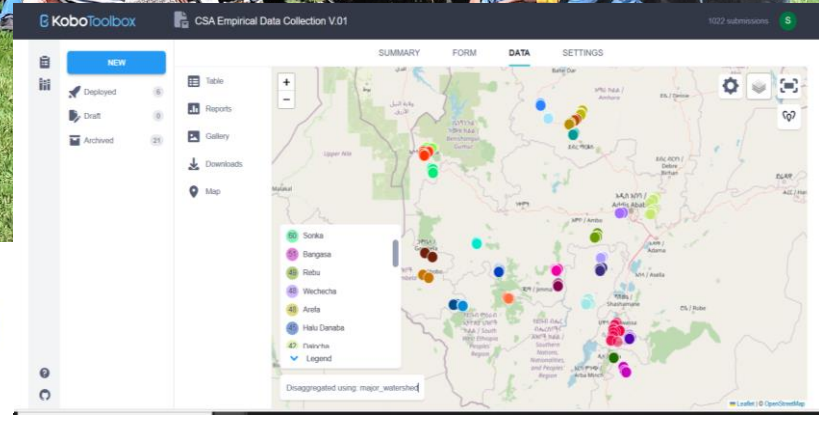
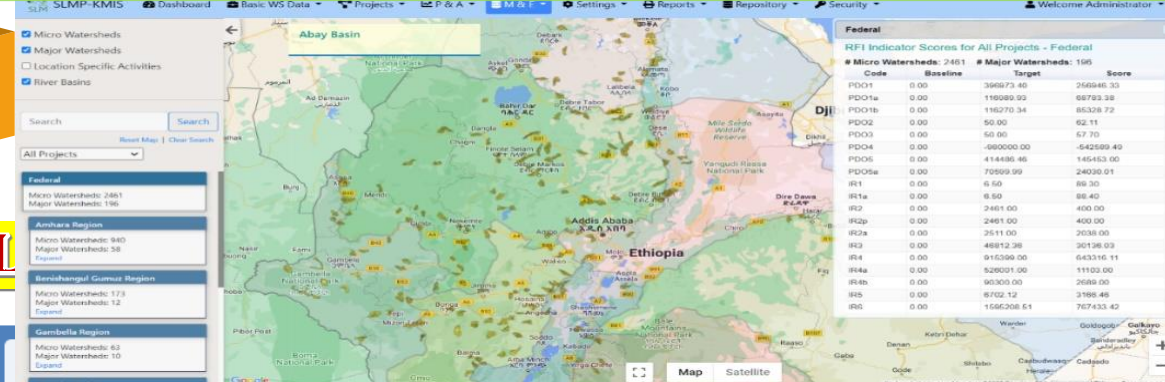
**Mobile Based Data Collection**  
KoboToolbox



**Financial Management IS (IFMIS)**  
Peachtree accounting software



**STEP Procurement System**



A magnifying glass with a black handle and frame is positioned over a field of green grass. The lens of the magnifying glass is focused on the text "THANK YOU!" which is written in a bold, black, sans-serif font. The background is a soft-focus green field with several dew drops on the grass blades. The overall scene is bright and natural, suggesting a fresh morning.

**THANK YOU!**